भारतीय मानक
Indian Standard

IS 4360 : 2020

वस्त्र रंजक सामग्री — पक्के क्षारकों की तीव्रता के निर्धारण की विधि

(पहला पुनरीक्षण)

Textile Dyestuffs — Method for Determination of Strength of Fast Bases

(First Revision)

ICS 59.040

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Textile Speciality Chemicals and Dyestuffs Sectional Committee, TXD 07

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Textile Speciality Chemicals and Dyestuffs Sectional Committee had been approved by the Textiles Division Council.

This standard was first published in 1967 and the present revision has been taken up to update the general information about analysis of fast bases given in Annex A.

Fast bases of different strengths are available in the market, therefore, determination of their strength is of importance to the consumer. The method outlined in this standard is useful for production control, production and import-export statistics where one normally deals with unblended fast bases.

The composition of the Committee responsible for the formulation of this standard is given at Annex B.

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’.

Indian Standard

TEXTILE DYESTUFFS — METHOD FOR DETERMINATION OF STRENGTH OF FAST BASES

(First Revision)

1 SCOPE

1.1 This standard prescribes a method for determination of strength of fast bases as listed in Annex A.

1.2 The method prescribed in this standard is not applicable to mixtures of fast bases.

2 REFERENCES

The following standard contains provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below:

IS No.	*Title*
1070 : 1992	Reagent grade water

3 PRINCIPLE

The fast bases (aromatic primary amines) are quantitatively diazotized with nitrous acid. Knowing the quantity and strength of the sodium nitrite used in the reaction, the strength of fast bases is determined.

4 SAMPLING

4.1 Lot

All the containers of the same fast base and of the same concentration delivered to one buyer against one despatch note shall constitute a lot.

4.2 Unless otherwise agreed to between the buyer and the seller, the number of containers to be selected at random from a lot shall be as given in Table 1.

4.3 From each container, draw small quantities of the fast base by a suitable sampling instrument from at least three different parts and mix them thoroughly to get a composite test sample weighing about 50 g.

Table 1 Sample Size

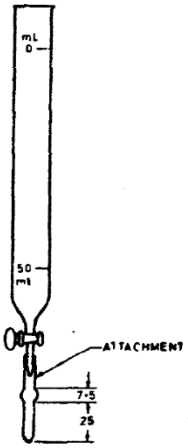
(*Clause* 4.2)

Lot Size	Sample Size
(1)	(2)
Up to 100	3
101-300	4
301-500	5
501 and above	7

5 APPARATUS

5.1 Mechanical Stirrer

5.2 Burette, with a small attachment as shown in Fig. 1.



All dimensions in millimetres.

FIG. 1 BURETTE WITH AN ATTACHMENT

5.3 Beakers, of 1 litre capacity.

5.4 Water-Bath

6 REAGENTS

6.1 Quality of Reagents

Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see* IS 1070) shall be used where the use of water or distilled water as reagent is intended.

NOTE — Pure chemicals shall mean chunk and that do not contain impurities which affect the test results.

6.2 Sodium Nitrite Solution, 0.5 N

6.3 Hydrochloric Acid, concentrated

6.4 Potassium Bromide Solution, 25 percent (w/v)

6.5 Standard Sulphanilic Acid Solution, 0.5 N

7 PROCEDURE

7.1 Take about 5 g of fast base from the composite test sample and weigh it accurately. Transfer it to 1 litre beaker. Add 50 ml of hydrochloric acid and 500 ml of distilled water. Dissolve the base completely by heating, if necessary (*see* Note 1). Cool it to room temperature and add 20 ml of potassium bromide solution (*see* Note 2). Keep the beaker in the water-bath containing chopped ice and water. Bring down the temperature of the contents in the beaker to about 5°C (*see* Notes 3 and 4).

NOTES:

1 For C.I. azoic diazo component 4 and C.I. aaoic diazo component 8, the base is first dissolved in 100 ml of glacial acetic acid by warming, if necessary. After cooling the solution to 20^0C, a mixture of 500 ml of water and 30 ml of concentrated hydrochloric acid is added. The solution is titrated immediately against sodium nitrite. Any precipitate formed initially will dissolve on addition of nitrite solution.

2 Potassium bromide is added as catalyst.

3 The temperature is brought to 5°C to avoid the loss of nitrous acid.

4 C.I. azoic diazo component 1 and C.I. azoic diazo component 5 may precipitate on cooling the solution to about 5°C. The diazotization should be carried out immediately as with time lapse, crystals may aggregate and lower the diazotization rate considerably.

Colour Index (1956). Ed 2. Society of Dyers and Coiourists, UK; and American Association of Tat & Chemists and Colorists, USA.

7.2 Immerse the tip of the burette well under the surface of the solution. Keep the solution under agitation with mechanical stirrer. Add the nitrite solution from the burette in small portions, and test the reaction mixture by putting a drop on starch iodide paper. Note the reading when the reaction mixture gives instantaneous blue colour with starch iodide paper (*see* Note 1).

NOTES:

1 The rate of addition of nitrite solution depends on how rapidly the base consumes the nitrous acid. There should be no large excess of nitrite present at any time, since this may cause loss of nitrous acid. At first the nitrite should be added in small portions and the solution tested by putting a drop on starch iodide paper. If the base consumes the nitrous acid rapidly, nitrite should be added more rapidly and *vice versa*. As the end-point is approached, nitrite will be consumed more slowly. The end-point is recorded when an immediate blue colour appears on starch iodide paper which can be obtained repeatedly during a period of 5 minutes without the further addition of sodium nitrite.

2 For the fast bases C.I. azoic diazo component 4 the reaction mixture is strongly coloured. To observe the end-point it is necessary to rinse the starch iodide paper with distilled water immediately after spotting. paper indicates excess of sodium nitrite. A blue ring on the starch iodide paper indicates excess of sodium nitrite.

7.3 Determine the normality of the sodium nitrite solution by titrating against standard sulphanilic acid solution (*see* **6.5**).

7.4 Calculate the strength of the fast base by the following formula:

$$P = \frac{A \times N \times M}{10 \times W \times B}$$

Where,

P = Strength in percent, by weight, of the fast base;
A = Volume in ml, of sodium nitrite solution;
N = Normality of sodium nitrite solution (*see* **7.3**);
M = Molecular weight of the fast base;
W = weight, in g, of the fast base (*see* **7.1**); and
B = Number of amino groups per molecule.

7.5 Repeat the test prescribed in **7.1** and **7.2** twice and calculate the strength of fast base by the formula given in **7.4**.

7.6 Calculate the average of the values obtained as in **7.4** and **7.5**.

8 REPORT

Report the value obtained as in **7.6** as the strength of the fast base.

ANNEX A

(*Clause* 1.1)

GENERAL INFORMATION ABOUT ANALYSIS OF FAST BASES

Sl No.	Colour Index Designation	Commercial or Trade Name	Colour Index No.	Molecular Weight	No. of Amino Groups per Molecule
(1)	(2)	(3)	(4)	(5)	(6)
i)	Azoic diazo component 1	Fast Bordeaux GP Base	C.I. 37135	168	1
ii)	Azoic diazo component 2	Fast Orange GC Base	C.I. 37005	164 (hydrochloride)	1
iii)	Azoic diazo component 3	Fast Scarlet GG Base	C.I. 37010	162	1
		Fast Scarlet GGS Base		422 (Sulphate)	2
iv)	Azoic diazo component 4	Fast Garnet GB Base	C.I. 37210	225	1
		Fast Garnet GBC Base		261.5 (hydrochloride)	1
v)	Azoic diazo component 5	Fast Red B Base	C.I. 37125	168	1
vi)	Azoic diazo component 8	Fast Red GL Base	C.I. 37110	152	1
vii)	Azoic diazo component 10	Fast Red R Base	C.I. 37120	157.5	1
		Fast Red RC Base		194.0 (hydrochloride)	1
viii)	Azoic diazo component 11	Fast Red TR Base	C.I. 37085	178 (hydrochloride)	1
ix)	Azoic diazo component 12	Fast Scarlet G Base	C.I. 37105	152	1
x)	Azoic diazo component 13	Fast Scarlet R Base	C.I. 37130	168	1
		Fast Scarlet RC Base		204.5 (hydrochloride)	1
xi)	Azoic diazo component 32	Fast Red KB Base	C.I. 37090	178 (hydrochloride)	1
xii)	Azoic diazo component 44	Fast Yellow GC Base	C.I. 37000	164 (hydrochloride)	1

Colour Index (1956), Ed 2. Society of Dyers and Colourists, UK; and American Association of Textile Chemists and Colorists USA.

The molecular weight of the bases varies depending upon the whether the base is 1 free base, hydrochloride or a sulphate. The common commercial names of the bases are also given as industry is familiar with it.

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Textile Speciality Chemicals and Dyestuffs Sectional Committee, TXD 07

Organization	*Representative(s)*
Department for Jute and Fibre Technology Institute of Jute Technology University of Calcutta	Prof A. K. Samanta (***Chairman***)
Ahmedabad Textile Industry's Research Association, Ahmedabad	Shri C. R. Prayag Ms Bipasha Maiti (*Alternate*)
Ama Herbals, Lucknow	Shri Y. A. Shah
Atul Ltd (Colors Division), Atul	Shri Sai Ganesh Shri Arindam Chakraborty (*Alternate*)
Central Institute for Research on Cotton Technology, Mumbai	Dr Sujata Saxena Dr A. S. M. Raja (*Alternate*)
Archroma India Pvt Limited, Mumbai	Shri Rajesh Ramamurthy Shri Ashim Ghosh (*Alternate*)
Department for Jute and Fibre Technology Institute of Jute Technology University of Calcutta	Dr D. Das
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Indian Jute Industries Research Association, Kolkata	Dr S. K. Chakrabarti Shri Sandip Basu (*Alternate*)
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National Peroxide Limited, Mumbai	Shri K. H. Deshpande Shri V. N. Joshi (*Alternate*)
Northern India Textile Research Association, Ghaziabad	Dr M. S. Parmar
Office of the Textile Commissioner, Mumbai	Shri Humayun K. Shri Jamil Ahmed (*Alternate*)
S G S India Pvt Ltd, Gurugram	Shri Goutam Kumar Swain Ms Niti Kumar (*Alternate*)
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Textiles Committee, Mumbai	Smt Shilpi Chauhan Shri Parvez Ahmed (*Alternate*)
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The Bombay Textile Research Association Mumbai	Smt Padma S. Vankar Shri M. P. Sathianarayanan (*Alternate*)
The South India Textile Research Association Coimbatore	Dr Prakash Vasudevan Shri S. Sivakumar (*Alternate*)
The Synthetic and Art Silk Mills Research Association, Mumbai	Dr Manisha Mathur Dr Rachna Shukla (*Alternate*)

Organization	*Representative(s)*
U P Textile Technology Institute, Kanpur	Prof Abha Bhargava Dr Arun Patra (*Alternate*)
Universal Starch Chem Allied Limited, Dhule	Shri D. A. Patil
Wool Research Association, Thane	Smt Smita Bait Shri Chetan Mahajan (*Alternate*)
Director General, BIS	Shri A. K. Bera Scientist 'F' and Head (TXD) [Representing Director General (*Ex-officio*)]

Member Secretary

Shri A. K. Bera

Scientist 'F' and Head (TXD), BIS

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